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Mr. Miller was absent from the colony on vacation leave from July 25th, 1935, to February 21st, 1936, during which period Dr. Saint acted as Director.

Dr. Saint was absent from the colony on duty leave from May 26th to June 6th, 1935.

Mr. Tucker was absent on vacation and duty leave from May 2nd to November 1st, 1935.

BRITISH WEST INDIES SUGAR CANE BREEDING STATION.

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The members of the Board of Agriculture, appointed for the Legislative
Session, 1935—36, were as follows:—

The Honourable S. C. Thorne, M.L.C., Chairman.

The Honourable G. L. Pile, B.A., M.L.C.

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The Director of Agriculture is an *ex officio* member of the Board.

* Mr. Cave resigned his post on January 31st, 1936, to take up an appointment as
Assistant Agricultural Officer in St. Kitts.

REPORT ON THE WORK OF THE DEPARTMENT OF SCIENCE AND AGRICULTURE.

FOR THE YEAR ENDING MARCH 31ST, 1936.

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SECTION I.

GENERAL AGRICULTURAL CONDITIONS.

As the annual report of the Department of Science and Agriculture covers twelve months, April 1st to March 31st, parts of two sugar cane crops are reaped during the period under review.

The drought of 1934 was followed by excellent weather during the reaping season 1934-35 with the result that the final figures amounted to 81,487.54 tons, made up as follows:—

				Long Tons of 2,240 lb.
Dark Crystals (96°)	..	..	..	40,087.45
Moscovado	..	..	..	2,273.34
Other Sugars	..	..	..	4,050.75
Fancy Molasses	..	..	..	35,076.00
				<hr/> 81,487.54 <hr/>

Until the middle of December 1935 a most excellent rainfall was experienced, not merely in the total volume recorded but especially in its distribution, which gave every promise of a crop in the neighbourhood of 140,000 tons for 1935-36.

Unfortunately this good growing weather was succeeded by one of the severest droughts ever experienced in the colony, the total rainfall for the first three months of 1936, registered at Codrington Experimental Station being only 2.10 inches:—

January	..	..	..	1.25 inches
February	..	..	..	.72 „
March	..	..	..	.13 „
				<hr/> 2.10 „ <hr/>

The result has been that the canes dried up exceptionally quickly and enormous tonnages of rotten canes have had to be left in the fields. Losses due to this may be estimated conservatively at 10,000 tons of sugar.

Such a loss, even with sugar at the very low price of less than £10 per ton, is extremely serious for Barbados and it is essential that steps should be taken to avoid any recurrence of such a misfortune.

There is no doubt that a number of the factories should have started milling operations two or three weeks before they actually commenced but even

† Equated at 330 wine gallons to the long ton.

so it must be admitted that the majority of factories in the island are not equipped to handle crops of the size of the present one. Putting the present crop at 127,000 tons, the average crop for the past ^{long} five years (including that following the drought of 1934) has been over 107,000^{long} of sugar.

The Department of Science and Agriculture has been in existence just over ten years and by its recommendations for better (and more) economical manurial practice, by the steady reduction of losses due to insect pests, and especially by the breeding of new varieties of sugar cane has raised the average crop by over 25,000 tons of sugar per annum.

The position at the moment is that given propitious weather the present sugar cane varieties can produce a crop which the present factory equipment is unable to deal with economically.

Factories in Barbados are either privately or else co-operatively owned. That is to say, although during what has in the past been called a normal crop they have been prepared, and even glad, to purchase canes from growers who have no share in the factory, the day has now come when they are compelled to refuse to buy canes because they cannot handle them quickly enough.

There is no doubt that a crop of 150,000 tons of sugar is a certainty in the near future and some provision must be made so that the factories can handle this output without the island being compelled to lose the hundred thousand pounds or so which has been thrown away this year.

FANCY MOLASSES.

The fancy molasses market opened very strongly and the exporters purchased approximately eleven and a half million wine gallons of the product. It was found impossible to market the whole of this in Canada with the result that at the end of 1935 nearly a million and a half gallons remained unsold in the island.

For a number of years the Department of Science and Agriculture, the Barbados Agricultural Society and the majority of molasses producers have been endeavouring without success to stabilise the industry by limiting production. The control of the industry has, however, not been theirs and it is only the fact that the exporters have found themselves with large stocks on their hands that has enabled the long-overdue stabilization to be carried out.

Even now the stabilization is only for the present season but it is considered that the successful operation of the Act will lead to its being made permanent in future years.

The principle of the Act depends on the fact that with sugar at its present low price the manufacture of fancy molasses is more profitable than that of sugar and in order to prevent certain of the dark crystal factories which are equipped to produce either commodity from making molasses and flooding the market and so deflating the price, a tax of a penny farthing a gallon has been charged on all molasses sold. The proceeds of the tax will be divided amongst sugar producers who have not made molasses after the passing of the Act.

In this way it is estimated that all sugar cane producers will receive approximately the same price per ton of canes whatever the destiny of their product.

The manufacture of fancy molasses from 1929 has been, according to the exports:—

1929	..	..	6,317,435 gallons.
1930	..	..	8,163,338 „
1931	..	..	7,131,148 „
1932	..	..	7,166,027 „
1933	..	..	7,589,813 „
1934	..	..	9,313,780 „
1935	..	..	10,203,139 „ *
1936	..	..	7,100,000 „ †

REAPING CENSUS.

The following tables show the acreage of the different varieties of sugar cane which are being reaped during the present campaign of 1935-1936.

* Includes approximately 1,500,000 gallons not shipped in 1935.

† Estimated manufacture.

PARISH.	RATOONS.									
	Ba. 11569	B. 2935	B. 726	B. 891	B. H. 10 (12)	B. 3013	B. 374	Miscellan- eous	Mixed	Total
Christ Chureh	224.00	360.25	276.50	23.00	11.00	..	7.00	36.50	83.00	1021.25
St. Philip ..	176.75	426.50	558.25	38.00	1.00	..	..	24.50	11.50	1236.50
St. Michael ..	142.00	118.25	262.25	..	67.50	..	..	..	3.00	593.00
St. Lucy ..	125.50	241.50	146.75	6.00	18.00	6.00	..	..	9.00	552.75
St. Peter ..	175.25	138.50	559.25	78.25	411.50	..	5.00	18.00	124.00	1509.75
St. Thomas ..	42.50	102.00	633.50	29.50	1235.25	..	5.50	8.50	38.75	2095.50
St. Joseph ..	14.25	..50	310.50	..	1020.00	..	..	..	..	1345.25
St. George ..	69.25	153.50	889.75	72.25	533.00	25.00	..	29.25	..	1772.00
St. Andrew ..	39.00	16.75	136.25	11.25	979.75	..	..	7.25	1.50	1191.75
St. James ..	58.00	149.00	436.75	..	259.00	..	..	3.25	52.00	958.00
St. John ..	76.50	57.25	723.00	58.00	1325.25	..	..	2.50	18.75	2261.25
Total ..	1143.00	1764.00	4932.75	316.25	5861.25	31.00	17.50	129.75	341.50	14537.00

PLANT CANES AND RATOONS.

PARISH.	Ba. 11569	B. 2935	B. 726	B. 891	B.H.10(12)	B. 3013	B. 374	Miscellan- eous	Mixed	Total
Christ Church	572 ³ / ₄	2226	693 ³ / ₄	50 ¹ / ₄	421 ¹ / ₂	..	211 ¹ / ₂	121 ¹ / ₂	95	3823 ¹ / ₄
St. Philip ..	443 ³ / ₄	2482 ¹ / ₂	1225	60 ¹ / ₂	31 ¹ / ₄	..	..	821 ¹ / ₂	241 ¹ / ₂	4322
St. Michael ..	285	6691 ¹ / ₂	660	4	1461 ¹ / ₂	..	..	6	3	1774
St. Lucy ..	437	13291 ¹ / ₂	3441 ¹ / ₂	9	411 ¹ / ₂	6	..	..	45	22121 ¹ / ₂
St. Peter ..	2891 ¹ / ₄	635 ¹ / ₄	10241 ¹ / ₂	102 ³ / ₄	615	..	5	21	128	2820 ³ / ₄
St. Thomas ..	541 ¹ / ₂	3781 ¹ / ₂	1022	291 ¹ / ₂	20161 ¹ / ₂	21 ¹ / ₄	51 ¹ / ₂	20	44 ³ / ₄	35731 ¹ / ₂
St. Joseph ..	221 ¹ / ₂	61 ¹ / ₂	479	..	15361 ¹ / ₄	1 ¹ / ₄	..	2	..	20461 ¹ / ₂
St. George ..	991 ¹ / ₄	496 ¹ / ₄	18161 ¹ / ₄	96 ¹ / ₄	10001 ¹ / ₄	29	..	51 ¹ / ₄	2	35901 ¹ / ₂
St. Andrew ..	147 ³ / ₄	86	2001 ¹ / ₂	113 ¹ / ₄	14551 ¹ / ₄	..	..	121 ¹ / ₄	31 ¹ / ₄	1916 ³ / ₄
St. James ..	130 ³ / ₄	7621 ¹ / ₂	839	21 ¹ / ₂	426 ³ / ₄	..	..	111 ¹ / ₄	59	2231 ³ / ₄
St. John ..	1301 ¹ / ₂	222 ³ / ₄	11701 ¹ / ₂	62 ³ / ₄	2031	..	..	21 ¹ / ₂	25 ³ / ₄	3645 ³ / ₄
Total ..	2613	92951 ¹ / ₄	9475	4291 ¹ / ₄	9314 ³ / ₄	371 ¹ / ₂	32	3301 ¹ / ₄	4301 ¹ / ₄	319571 ¹ / ₄

The above tables do not include sugar cane grown by smallholders, the acreage of which is estimated to be approximately 3,750, making a total for the island of approximately 35,750 acres.

COTTON.

Only 247 acres of Sea-Island cotton were planted in 1935. This compares most unfavourably with the three thousand odd acres planted around 1925-27 and again in 1930.

The low acreage is due to a number of causes, first and foremost amongst which has been the poor price. Planters, as a whole, are not prepared to grow cotton unless they can be assured of seven or eight cents per pound for their seed cotton and until the present moment this price has not been obtainable for the past seven years.

The cotton growing areas of the colony are the parishes of St. Philip and St. Lucy. In the good old days before the onslaught of the pink bollworm cotton was planted as the first rains came in and remained in the ground for about ten months so that virtually two reapings were possible and in the aggregate heavy yields were made.

Since the necessity for a quick crop has arisen if the losses due to pink bollworm are not to be too severe, planting has been allowed from the beginning of August, while the last date for uprooting has been May 31st.

While this period has been suitable for the St. Philip area and good crops have been made the areas of St. Lucy in which cotton is wont to be grown have not fared so well. Unless the cotton can get an even and rapid germination the plants are liable to be severely damaged by the salt-laden winds which are usually experienced during September and October in the northern parish and the result has been that the acreage under cotton has greatly diminished.

In past decades the damage caused by the root borer (*Diatrypes abbreviatus*) limited the ratooning of sugar cane to the wetter parts of the island and the black soil areas were compelled to find an alternative crop—in many cases cotton—to follow their sugar.

In recent years this pest has been to a very great extent under control and this control has allowed the ratooning of sugar and so cotton growing is no longer the necessity it formerly was.

Nevertheless, the extent to which ratooning sugar cane has been carried in the black soils spells danger and it is hoped that ere long the area under cotton will be more comparable to what it used to be than it is at present.

GROUND PRODUCE.

The cultivation of sweet potatoes and other ground produce continues to feel the lack of an export market. At the risk of being charged with reiteration it cannot be emphasised too strongly what the virtual closure of the British

Guiana market has meant to Barbados. The growing of ground produce was to a large extent in the hands of peasant farmers and the lack of an outside outlet for sweet potatoes and yams has lowered the local price to such an extent that the acreage under these crops has been greatly restricted.

PEASANT AGRICULTURE.

During the period under review provision has been made by the Legislature for the appointment of a Peasants' Agricultural Instructor. The appointment will date from the opening of the next financial year and should prove of the greatest value to the small holders in the colony.

SECTION II.

WORK OF THE DEPARTMENT OF SCIENCE AND AGRICULTURE.

(a) REPORT ON PLANT BREEDING AND SEEDLING TESTING.

By A. E. S. McINTOSH, B.Sc., Ph.D.,
Botanist.

I. SUGAR CANE.

A. SUGAR CANE BREEDING, SEEDLING RAISING AND TESTING.

B. SPECIAL INVESTIGATIONS.

II. SWEET POTATO.

A. VARIETY TRIALS.

B. SEEDLING TESTING.

III. COTTON EXPERIMENTS.

IV. TOMATO VARIETY TRIAL.

I SUGAR CANE.

A. SUGAR CANE BREEDING, SEEDLING RAISING AND TESTING..

Sugar Cane breeding was carried out at Lion Castle during October, November and December 1935.

In all, eighty-five crosses were made. These are summarised below.

	Group		Number of Crosses	Totals
(a)	Crosses between varieties of noble cane.			
	(<i>Saccharum officinarum</i>)	.. ..	19	19
(b)	Nobilisations of <i>Chunnee</i>			
	(<i>Saccharum barberi</i>)			
	1st degree	.. ..	4	8
	2nd " ..	.. ..	1	
	3rd " ..	.. ..	3	
(c)	Nobilisations of <i>Saccharum spontaneum</i>			
	(i) North Celebes form			
	3rd degree	.. ..	2	2
	(ii) Java form			
	2nd degree	.. ..	2	41
	3rd "	.. ..	6	
	4th "	.. ..	20	
	5th "	.. ..	13	
	(iii) Indian form			
	1st degree	.. ..	1	1
(d)	Nobilisations of Uba			
	(<i>Saccharum sinense</i>)			
	1st degree	.. ..	2	2
(e)	Crosses involving various species of <i>Saccharum</i>	.. ..	12	12
Grand Total ..				85

Details of the crosses made and notes on the germinations obtained will be published in a subsequent report.

SUGAR CANE SEEDLING, POTTING AND PLANTING OUT.

Approximately 19,300 seedlings from the above crosses were potted during January and February.

Pottings were allocated as follows:—

(a)	Crosses between noble canes	11,000
(b)	Nobilisations of <i>Saccharum barberi</i>	160
(c)	Nobilisations of <i>Saccharum spontaneum</i>	
	(i) North Celebes form	30
	(ii) Java form (2nd to 5th degree)	4,900
	(iii) Indian form	600
(d)	Nobilisations of <i>Saccharum sinense</i>	90
(e)	Mixed derivation	2,520
	Total	19,300

Approximately 15,000 of these seedlings are to be planted in a field nursery during April 1936. During October and November 1936 approximately 10,000 will be selected from the field nursery and planted in routine first year seedling trials.

These will be reaped in 1938 and constitute the B.38' series of seedlings.

FIRST YEAR SEEDLINGS. B.37' SERIES.

These were bred in 1934 and approximately 12,200 planted into the field nursery in April 1935. During October and November 1935 selections from the field nursery were planted in first year seedling trials to be reaped in 1937.

This first year seedling planting comprised approximately 7,400 seedlings. It is thus seen that approximately 40% of the seedlings were eliminated in the field nursery stage. The features used for elimination were (1) cane width, (2) presence of arrowing and (3) number of canes. Especial emphasis was laid on the first two characteristics.

The first year seedling plantings were allocated as follows:—

Group	No. Crosses	No. seedlings
(a) Proven and Semi-Proven Crosses ..	12	4,798
(b) Experimental Crosses. (Chiefly higher degrees of nobilisation).	38	2,363
(c) Early nobilisations. (Chiefly to provide breeding material)	7	232
	57	7,393

SUGAR CANE SEEDLINGS. B.35' SERIES.

During the crop in 1935, the following seedlings were selected from the first year seedling trial:—

Noble-cane (thick-cane) seedlings	115
Nobilisations	86

The former were planted in multiplication, gumming resistance test and minor selection plots at Codrington and Dodds. Final selections from these plots will be planted in November in 1936 in routine second year trials.

Of the 86 nobilisations, 48 were planted in November 1935 in a second year trial at Codrington. This trial will be reaped during crop of 1937. Selections from this trial are intended for British West Indian colonies outside Barbados.

SUGAR CANE SEEDLINGS. B.34' SERIES.

During October 1935, final selections were made in the multiplication plots of thick-canes in this series. The selections were planted in November 1935 in routine second year trials at Dodds and Todds.

The selected nobilised seedlings of this series—34 in all—were tested during season 1934/36 in a second year trial at Codrington. This trial was reaped and eleven selections made and despatched to the Plant Quarantine Station in Trinidad for test in other British West Indian Colonies.

SUGAR CANE SEEDLINGS. B.33' SERIES.

These were reaped during the 1936 crop at Dodds and Todds. Four seedlings were finally selected for further trial.

SELECT SEEDLING TRIALS. B.31' AND B.32' SERIES.

These trials included the following seedlings—B.3124, B.3125, B.3127, B.3138, B.3179, B.3216, B.3234 and B.3239. The B.32' seedlings appeared in plant cane trials only while the B.31' seedlings were reaped both in plant cane and first ratoon trials.

Eight plant cane and four first ratoon trials were reaped. The results of these trials are not yet fully analysed, but the following tentative conclusions are presented.

B.3124 shows some promise as an early variety for low-rainfall areas. It has been included in variety trials for season 1935/37.

B.3127 has given an excellent all round performance as a plant cane but more especially as a ratoon. Its only apparent disadvantage lies in its tendency to back-root and make reaping somewhat difficult. This seedling is to be tried extensively in variety trials during season 1936/38.

B.3125, B.3138, B.3179 and B.3216 gave average performances, but are not considered to better the standard varieties and will no longer be tested.

B.3239 is definitely inferior and will be discarded. B.3234 is reported on below.

VARIETY TRIALS. PLANT CANES. 1934/36.

These were designed to test the seedlings B.3013 and B.3234 against standard varieties B.726 and B.H.10 (12) in medium to high rainfall districts.

In all fourteen trials were reaped. B.3013 yielded well throughout the trials and is distinctly promising as a commercial variety. B.3234 yielded very high tonnages only where growing conditions were very favourable. At best, it would appear to have the possibility of becoming a commercial variety in very restricted areas only.

It is anticipated that twelve of these trials will be cut as ratoons in 1937, when final conclusions as to the value of these two seedlings will be made.

B. SPECIAL INVESTIGATIONS.

MATURITY EXPERIMENTS AND GROWTH MEASUREMENTS.

These concern investigations into the seasonal growth of select seedlings and their rates of vegetative and chemical maturity during the crop period. It is largely as a result of these measurements and experiments that it is known, for seedlings eventually selected for large scale variety trials, to which areas and time of reaping each is likely to be best suited.

During 1935, the usual fortnightly growth measurements were made for selecting seedlings in the maturity experiments, both plant cane and ratoon, and the usual procedure was adopted at the reaping of the plant cane experiments.

ROOT SYSTEM INVESTIGATIONS. 1935/1936.

The investigations noted here are essentially similar in nature to those made in season 1933/34 and reported in detail in Bulletin No. 5 of the British West Indies Central Sugar Cane Breeding Station.

A few minor alterations in technique have been made and in addition greater attention is being focussed on the extent, time and place of development of fibrous roots.

For purposes of assessing the seasonal effect on root development, the following varieties whose root development was studied in 1933/34 are re-included in this investigation—B.726, B.H.10(12), Ba.11569, P.O.J.2878. In addition, the following varieties are included in the present investigation—Uba, Co.213 and *Saccharum spontaneum* (Indian form).

Investigations are made at four periods in the season. Already three have been done and the fourth and last will be made sometime during May.

The results of these investigations will be reported in detail during the year.

GUMMING DISEASE STUDIES.

These are considered under two heads, i.e., (1), routine and (2), experimental. The routine studies comprise periodic inspection of selected first year seedlings when these are being multiplied or included in special gumming disease resistance plots at Dodds. Degrees of resistance are determined by

extent of leaf symptom development at fortnightly intervals during the rainy season and the early part of the crop season.

In this way seedlings susceptible to gumming disease are eliminated from further test. Moreover, information is steadily accumulating on the inheritance of resistance to the disease. The latter is used in guiding the breeding work.

During 1935, 93 noble cane seedlings were observed and 18 eliminated on account of susceptibility.

In addition 77 seedlings with a greater or less proportion of wild blood were observed. Two seedlings only showed susceptibility.

The experimental study consisted in a repeat investigation into the relation-ship between extents of leaf and systemic infections. Twenty varieties were used, chosen on account of their previously having shown a range of leaf infection intensities. Their leaf infection intensities were noted during 1935/36 and at five distinct periods cane cuttings were taken from each and sweated. The extent of systemic infection was noted by the number of globules per exposed cane cross-section.

The practical conclusion from this and the previous similar experiment conducted in 1933/34 is that varieties which show no or few leaf symptoms do not show indications of systemic infection and may be classed as commercially resistant to gumming disease. Any seedling therefore showing more than a fixed standard of leaf symptom intensity is eliminated in its early stages.

A detailed account of Gumming Disease Investigations in Barbados was recently published in Bulletin No. 8 of the British West Indies Central Sugar Cane Breeding Station.

ZEISS HAND REFRACTOMETER STUDIES.

Comprehensive experiments carried out in first and second year seedlings during the crop of 1935, showed this instrument to give, by certain sampling methods, sufficiently accurate indication of seedling sucroses, as to warrant its use in the seedling stages. The use of this instrument in routine seedling work would lessen the labour of obtaining cane samples, of transporting and milling them. At the same time, and in view of the ease of working this instrument, it would be possible, in first year seedlings to obtain a better indication of juice quality inheritance by being enabled to sample more cross populations and more individual seedlings in each.

From further experiments with this instrument, in the maturity experiments during the 1935 crop, it would appear that it will prove valuable in comparing the rates of chemical maturity in select seedlings.

An account of these studies in first and second year seedlings has recently been published in the Journal of the Department of Science and Agriculture, Barbados, Vol. 5, No. 1.

FUZZ STORAGE TESTS.

For reasons already known, the first year seedling trial is now planted in November of any year. It is therefore necessary either to plant the seedlings into a field nursery in April and replant from this in November, or store the harvested cane fuzz until the end of July so that the seedlings raised from the fuzz at that time are ready to plant in November.

Fuzz storage tests were carried out in 1935. Fuzz samples of 21 crosses were stored in sealed tins at room temperature from December 1934 to July 1935. Four treatments were tested, i.e. tins with (1), air alone (2), CO_2 alone, (3) CaCl_2 alone and (4), $\text{CaCl}_2 + \text{CO}_2$. The last proved the best treatment. The germinations were here 25% of original sowings. Even this best method of storage gives impracticable results.

This year the experiment consists in storage of fuzz at three temperatures, i.e. (1) 32°F ., 42°F . and room temperature and (2) three concentrations of calcium chloride, i.e. (1) 5, 10 and 20 grms. CaCl_2 per 1,000ecs. tin space.

(Elsewhere in this report, it has been shown that a considered very valuable elimination of poorer seedlings can be made in the field nursery prior to planting. For this reason, it is considered that the field nursery, although entailing considerable labour, etc., in preparation and planting, is of great value in seedling selection. It has therefore been decided that the field nursery be a routine stage in the seedling work and that after this year the fuzz storage experiments be stopped).

II. SWEET POTATO.

A. VARIETY TRIALS.

The *long crop* trial was reaped at Ellesmere plantation in May, 1935.

This trial comprised three standard varieties—Red Nut, Black Rock and V.52, and six Barbados seedlings: the survivors from the series of tests of the first batch of seedlings raised in 1928.

This trial concluded the tests on this batch of seedlings. As a result of all tests on those seedlings, the following were recommended during the year for commercial cultivation—B.5, B.6 and B.44. Slips of these new varieties were distributed from Codrington Experiment Station during the latter part of 1935.

B. SEEDLING TESTING.

This section concerns tests of a second batch of seedlings raised in 1932. The selections in this batch were at the beginning selected for *short cropping* and *long cropping* purposes.

By 1935 the *short crop* group was reduced to eleven seedlings. These, along with four standard varieties—Red Nut, V.52, B.5, B.6—were tested in a short crop trial at Codrington from July to November 1935. At reaping, yield data was taken, and observations made on size and shape uniformity, and

flesh colour and smoothness of stem of the potatoes. Cooking tests were carried out for all seedlings. As a result of the field and cooking tests, the following six seedlings were selected for further tests—B.20, B.26, B.29, B.32, B.33, B.34. These are being multiplied for inclusion in a *short crop* trial during 1936.

The *long crop* group was grown in a trial at Golden Ridge estate and reaped at the end of May, 1935. This trial contained four standards—Red Nut, V.52, Trinidadian, B.44—and twenty four seedlings. The usual field data was obtained and cooking tests made. Twelve seedlings were finally selected for further tests. These are B.49, B.52, B.55, B.56, B.58, B.59, B.61, B.62, B.63, B.64, B.66, B.68.

These were multiplied during 1935 and planted in November with four standards—B.5, B.6, B.44 and V.52—in a *long crop* trial at Walkes Spring estate. This trial will be reaped at the end of April 1936.

III. COTTON EXPERIMENTS.

With prospects of a return of the demand for Sea Island cotton, the Department has initiated investigations in various strains of Sea Island cotton. In general, it may be stated that these investigations are directed towards finding out the strain of cotton most suited economically to Barbados.

Experiments were conducted during the cotton season 1935/36. These may be considered under two heads, i.e. (1) tests with Barbados Sea Island cotton and (2) comparison between Barbados and other British West Indian strains of Sea Island cotton. These are briefly described below.

TESTS WITH BARBADOS SEA ISLAND COTTON.

The object of these tests was to find out if any appreciable variation existed within the Barbados strain and, if so, to isolate the best of these to serve as a basis for routine progeny row testing and bulking for seed distribution.

For purposes of testing the range of variation in Barbados cotton seed was obtained from nine distinct sources in the Island. This was considered possibly to cover the range of variation, if present, in the Barbados cotton.

An experiment was laid out to test if there was any real difference between the progenies of the nine seed collections. At the same time single tree selections for future progeny row work were made in this trial.

COMPARISONS BETWEEN BARBADOS AND OTHER BRITISH WEST INDIAN STRAINS OF SEA ISLAND COTTON.

For this purpose Barbados cotton was compared in two field trials with the following introductions:— (1) St. Vincent Superfine—V.132, (2) St. Vincent B.D., (3) St. Vincent A.N., (4) Montserrat, (5) St. Kitts.

The trials were single 6 x 6 Latin Squares, with approximately 1/50 acre plots. They were sown in August 1935 and picked during January and February 1936.

One of the trials was destroyed by pink bollworm. In the other trial field data was obtained on yield and time of yield of seed cotton. The seed cotton for each variety was then bulked and the ginning per cent. and lint index of each ascertained, the former from the entire pickings, the latter from samples. The cotton was then bagged and has been despatched for brokers and manufacturers' reports on lint quality and value.

A detailed report on these trials will be published later.

Since no actual cotton breeding work is practicable in Barbados, the intention is for the future, to adopt the best of these varieties for commercial planting in Barbados and as the medium for future progeny row work. It follows that, should the Barbados variety be best in these variety trials, the progeny row work noted above will be continued. Should, however, an introduced variety, by these variety trials, prove to be better than the Barbados variety, progeny row work in the latter will cease and be transferred to the former.

IV. TOMATO VARIETY TRIAL.

INTRODUCTION.

The object of tomato variety trials is to find out whether any variety is better than the existing standard variety—Marglobe. During 1935, six varieties from Sutton & Sons were tested in a comprehensive trial with Marglobe as standard. The Marglobe plots were late in being fully established so that it was not possible to make definite comparisons between the Sutton's varieties and Marglobe. Three of the most promising of the Sutton's varieties in this trial were selected and tested against Marglobe during the early part of the year. This trial is reported here.

The Trial.

Varieties—Marglobe (standard)

Best of All	} Sutton's
Majestic	
Open Air	

Lay Out—4 x 4 Latin Square.

Plot Size—3 x 3 cane holes.

Plants per Plot—81.

Seed was sown in boxes on 5th December, 1935 and planted out in the field on 29th December 1935. On 7th January 1936, one irrigation was given and the plots supplied on 8th January. A good uniform stand was obtained. Artificial manure was applied on 9th January.

Fruit picking started on 19th February and was completed by 4th April. Throughout the period, pickings were made at 2 to 3 day intervals.

Data.

All fruits as picked were sized. Plot weights were ascertained at each picking. Periodic notes were made on the appearance of the fruits, especially colour, shape and extent of cracking.

Results.

(1) *Weight.* The mean plot yields for each variety for the entire picking period are given below.

Best of All	— 70.46 lb.	15,109 lb. per acre
Open Air	— 63.64 „	13,647 lb. „
Majestic	— 63.49 „	13,615 lb. „
Marglobe	— 60.70 „	13,017 lb. „

A statistical significant difference between mean plot variety yields was ± 9.78 lb. The differences in yield between varieties was therefore not significant.

(2) *Size and Number of Fruits.* Data on these features is presented below.

Variety.	Size.										No. of Fruits.
	4"	3 $\frac{3}{4}$ "	3 $\frac{1}{2}$ "	3 $\frac{1}{4}$ "	3"	2 $\frac{3}{4}$ "	2 $\frac{1}{2}$ "	2 $\frac{1}{4}$ "	2"	1 $\frac{3}{4}$ " or less	
Best of All ...			2	2	7	11	133	499	903	858	2,415
Majestic ...		3	1	19	74	135	276	350	368	173	1,399
Open Air ...	2	14	9	37	101	173	320	343	253	108	1,360
Marglobe ...				6	72	148	317	373	261	46	1,223

The fruits of Best of All were much too small for marketing purposes. The fruits of Open Air were mis-shapen and skin-cracks were numerous.

The variety Majestic was the most promising. The bulk of its fruits were approximately the same size as Marglobe fruits. The yields of fruit of both varieties were approximately similar. The advantage of Majestic over Marglobe lay in its producing its crop about a fortnight to three weeks earlier than Marglobe.

The fruits of Majestic have a nice appearance and possess an acceptable flavour.

Conclusions.

Of the three Sutton's varieties tested, Best of All and Open Air are rejected on account of small fruit size and poor fruit appearance respectively.

Majestic is promising on account of a good and early yield of good size, attractive fruits. This variety will be further tested against the standard—Marglobe.

CHEMICAL.

REPORT OF CHEMICAL SECTION

By S. J. SAINT, M.Sc., Ph.D., F.I.C.

Assistant Director and Chemist.

I. ANALYTICAL WORK.

1. FOOD AND DRUGS LABORATORY.
2. SUGAR LABORATORY.
3. ANALYSIS OF SEEDLING CANES.

II. ADVISORY AND INVESTIGATIONAL WORK.

1. SUGAR TECHNOLOGY.
2. SOILS.
3. MANURING.

I. ANALYTICAL WORK.

1. FOOD AND DRUGS LABORATORY.

The total number of samples examined in the laboratory for the various Government Departments and for private individuals during the year was 1,274.

The number and distribution of samples dealt with annually for the past four years is set out in Table I.

TABLE I.

	1935	1934	1933	1932
1. Police Department ..	494	317	236	417
2. Customs " ..	131	212	197	137
3. Public Works Department	13	26	12	8
4. Agricultural " ..	45	147	241	4
5. Sanitary " ..	10	17	6	10
6. Agricultural Society ..	349	236	254	328
7. Other Govt. Departments	3	5	18	7
8. Private Individuals ..	229	232	295	364
Total	1,274	1,192	1,259	1,275

Fuller particulars of the various samples analysed in the Food and Drugs Laboratory for 1935 are as follows:—

1. Police Department:

Viscera and Examinations for poisons	..	..	28
Coins and counterfeit exhibits	..	..	144
Milks	..	..	56
Rums	..	..	73
Butters and Margarines	..	..	21
Cooking Oils	..	..	47
Cocoa and Cocoa essences	..	..	29
Tea	..	..	32
Exhibits in connection with corrosive liquid throwing	..	..	18
Miscellaneous	..	..	46
Total			494

NOTES.

Examinations for Poison.

Arsenic.—a sample of cocoa suspected of containing some poisonous substance was found to contain arsenic.

Samples of viscera, from a person suspected to have been poisoned were examined, but only traces of arsenic could be found. The medicine which the deceased had taken contained arsenic in small quantity.

Mercury.—samples of milk and sago were examined for poisons, and were found to contain the equivalent of $3\frac{1}{2}$ grains of Mercuric chloride.

Phosphorus.—samples of viscera from a deceased person, who was suspected of taking poison, were examined and phosphorus was discovered.

Lead.—a sample of food examined for poisons was found to contain $11\frac{1}{4}$ grains of lead as Lead acetate.

Powdered Glass.—from another sample of food $1/10$ ounce of powdered glass was separated.

Sodium Carbonate.—a sample of suspected foodstuffs was examined and found to contain washing soda.

Nitro-benzene.—the washings from a stomach were found to contain a small amount of nitro-benzene.

Strychnine.—a powder suspected of being poisonous was examined and found to be strychnine.

Coins and Counterfeiting Exhibits.

A very large number of samples of counterfeit coins and exhibits in connection with counterfeiting were received for examination and report during the year. Fourteen coins were found to be counterfeit, and the exhibits consisted chiefly of alloys similar in composition to the coins, and plaster of paris moulds.

Milks.

Fifty-six samples of milk were received for analysis, and, of these, eighteen, or thirty-two per cent. were reported as adulterated.

Rums.

Seventy-three samples of rum were examined, and, of these, three were found to be below the statutory limit of 25 degrees under proof.

Butters and Margarines.

Twenty-one samples of butter and margarine were examined, and one sample was found to contain more than 16 per cent. water.

Cooking Oils.

Forty-seven samples were examined, and found to consist mainly of cotton seed oil or coconut oil.

Cocoa and Cocoa Essences.

The standards which are adopted in the examination of these products are, that cocoa should contain not less than 20 per cent. cocoa fat, and cocoa essence should contain between ten and twenty per cent. of cocoa fat. It was found that ten samples sold as cocoa contained less than 20 per cent. cocoa fat.

Tea.

All samples submitted were found to be of satisfactory quality.

Miscellaneous.

These samples included flour, tapioca, corn meal, sago and falernum; all of which were found to be of good quality.

Seventeen samples of stout were analysed in connection with a case in which the defendant was charged with selling stout under a false trade mark. The stout in the bottles submitted was found to have a very different composition to stout genuine in respect to the trade mark.

2. Customs Department.

Petroleum	..	..	..	91
Condensed Milk	..	..	..	6
Butters and Margarines	..	..	..	24
Textiles	..	..	..	4
Miscellaneous	..	..	..	6
Total				131

Petroleum.

These samples consisted chiefly of kerosene oils for flash point determinations, and petrols for specific gravity determinations. All of the samples of kerosene oil had flash points well within the limits prescribed by the Petroleum Act.

Condensed Milks.

All the samples of condensed milk examined were found to contain more than 9 per cent. fat, and classified accordingly under the Customs Tariff Act.

Butters and Margarines.

Under the Food and Drugs Act, all butters and margarines must contain less than 16 per cent. water before being allowed import. Of the 24 samples examined, two samples of butter were found to contain more than 16 per cent. water.

Textiles.

These textiles were examined in respect of their cotton and silk contents, and two samples were found to contain less than 50 per cent. natural silk.

Miscellaneous.

Various samples such as lime rum, colas, tobacco oil, etc., were received for analysis, and an expression of opinion as to classification under the Customs Tariff Act.

3. Public Works Department.

Water	..	..	..	11
Fuel Oil	..	..	..	2
Total				13

Water.

Analyses of the water supplied to the public were carried out periodically during the year. The analyses showed a high chemical organic purity.

Fuel Oil.

Samples of oil, as used at the various pumping stations, were analysed and found to be up to the guaranteed specification.

4 Department of Agriculture.

Twenty-four samples of sour grass were dealt with according to the customary feeding stuffs analysis, and certain of the samples were ashed and the ash analysed.

A detailed examination was made during the year of the Laboratory Beaumé Standards.

The chlorine contents of various samples of cane juice were determined and miscellaneous analyses were also made in connection with various activities of the Department.

5. Sanitary Department.

Sardines	..	..	3
E. C. Disinfectant	..	..	3
Water	..	..	4
Total			10

The sardines, which were in tins and were suspected of being unfit for food, were examined and found to be in good condition.

The free chlorine was determined in the E. C. Disinfectant, which is manufactured by this Department by an electrolytic method, in order to verify that the requisite strength was maintained.

6. Agricultural Society.

Feeding Stuffs	..	..	115
Fertilizers	..	..	46
Sugars and Molasses	..	..	188
Total			349

Fertilizers and Feeding Stuffs.

These samples were received from the official samplers of the Agricultural Society and were analysed under the Fertilizers and Feeding Stuffs Act. All samples were found to be unadulterated and to correspond closely with their guaranteed analysis.

Sugars and Molasses.

These samples were analysed in connection with the prize awards of the Annual Industrial Exhibition. A detailed report of the result of the examination was submitted to the Agricultural Society.

7. Other Government Departments.

Mental Hospital	..	..	1
Central Road Board	..	..	2
Total			3

Mental Hospital.

One sample of water from the well at the Hospital was examined and found to be chemically pure.

Central Road Board.

Two samples of road oil were received for analysis and for an expression of opinion as to their respective merits for road purposes.

8. Private Individuals.

Analyses are carried out for private individuals for which fees are charged by Government in accordance with the Scale set out in the Schedule to the Department of Science and Agriculture Act.

The following analyses were carried out during the year:—

Cane Juices	..	..	69
Sugars and Molasses	..	..	49
Waters	..	..	14
Hydrometers for checking		..	9
Petroleum Oils	..	..	9
Fertilizers	..	..	37
Milks	..	..	6
Miscellaneous	..	..	36
Total			229

The fees receivable by Government for these analyses amounted to £99 9. 6. for the year.

2. SUGAR LABORATORY.

Most of the consignments of sugars, fancy and choice molasses sent to Bridgetown are sampled, and the samples are analysed in this Laboratory. This analysis serves as a basis in assessing the price paid by the buyer to the manufacturer.

As this Laboratory has been organised and run as a commercial undertaking by Government, particulars of the number of samples dealt with, revenue and expenditure are given in Table II for the past seven years.

TABLE II.

Year	Number of Samples		Expenditure	Revenue	Excess of Revenue over Expenditure
	Sugar	Molasses			
			£ s. d.	£ s. d.	£ s. d.
1929-30 ..	29,978	8,114	868 0 0	1,904 12 0	1,036 12 0
1930-31 ..	20,181	9,899	798 0 0	1,504 0 0	706 0 0
1931-32 ..	18,141	9,712	715 0 0	1,392 13 0	677 13 0
1932-33 ..	25,916	8,194	761 0 0	1,705 10 0	944 10 0
1933-34 ..	36,669	10,947	797 0 0	2,380 16 0	1,583 16 0
1934-35 ..	18,071	10,092	600 0 0	1,408 3 0	808 3 0
1935-36 ..	43,744	10,998	710 0 0	2,737 2 0	2,027 2 0

It will be noted that, for the year 1935-36, a total of 54,742 samples of sugars and molasses were dealt with, which is the largest number that has yet been analysed in any one year. The number of samples of sugar received for testing during the early months of 1936 was so large that extra bench room had to be provided in the Food and Drugs Laboratory, and additional temporary staff had to be engaged to cope with the increased work.

3. ANALYSIS OF SEEDLING CANES.

In connection with the genetical work and manurial trials carried out by the Department of Agriculture, representative samples of cane are sent in for analysis.

During the year, a total of 4,692 bundles of cane were milled in the Machinery Room, and the expressed juice analysed; where the composition of the whole cane was needed, analyses were made of the megass.

The results of these analyses will be incorporated in the subsequent detailed reports of the respective trials by the Botanist and Chemist.

II. ADVISORY AND INVESTIGATIONAL WORK.

1. SUGAR TECHNOLOGY.

ADVISORY.

A large number of advisory visits were made during the crop season to dark crystal, muscovado and fancy molasses factories.

Owing to the large demand for fancy molasses, and the smallness of the

total crop, fancy molasses was manufactured by factories which had never handled the product in any large quantity before. Methods of manufacture which had been worked out in the laboratory were applied to large scale production with marked success. Many new problems which arose in the factory had to be solved and the services of the chemical section were freely called upon. The advice and assistance rendered were generally appreciated.

CHEMICAL CONTROL SCHEME.

The scheme for providing chemical control of the manufacturing process in the smaller vacuum pan factories was continued for the fourth successive crop season. The provision of chemical control in these factories has undoubtedly proved of very great benefit.

The value of chemical control has also been demonstrated in the larger fancy molasses factories, and one or two have already installed polariscopes and the necessary apparatus.

INVESTIGATIONAL.

The providing of advice and assistance is regarded as the primary function of the Department, so that, owing to the time which had to be devoted to advisory work, there were few opportunities for continuing the investigations on pan boiling which had been planned. The curometer which has been installed at Bulkeley Factory has been used in the routine boiling of low purity strikes with marked success during the crop season.

The work carried out last year at this factory demonstrated the bad circulation which existed during boiling in the low purity massecuite pan. As a result, a stirring device was installed in this pan with a consequent saving of about three hours on the boiling of each massecuite.

Laboratory experiments on different aspects of fancy molasses manufacture were continued in the out of crop season. Investigations have been made with the object of finding an efficient method of clarification in an acid medium. With this object in view, phosphate precipitation studies have been made under varying conditions, and results of considerable interest are indicated. As time permits, this work will be continued with the object of improving the present commercial methods.

2. SOILS.

ADVISORY.

Samples of soil are taken on request from plantations for analysis, and from the analytical results and the data which has been accumulated on local soils, advisory reports are issued, giving manurial and other recommendations.

INVESTIGATIONAL.

With the object of obtaining a greater knowledge of the local soils, and a more accurate interpretation of analytical soil data, soil samples have been taken from manurial trial plots for analysis. The plots selected for sampling are selected from those centres which have shown definite responses in yield of sugar cane to potash and/or nitrogen fertilizers.

The investigation into the nitrogen status of arable soils has been continued. Samples of soil representative of black, red, St. George's Valley, and red sand soils have been taken weekly and determinations of moisture, nitrate, ammonia and total nitrogen have been made.

3. MANURING.

SUGAR CANE.

Trials to test the effect of various amounts and kinds of fertilizers on the yield of cane, and per cent. sucrose in juice, have been carried out at different plantations. The results of these trials bear out the results obtained in previous years and indicate that although the behaviour of soils on different plantations may vary with their previous history, nitrogen and potash deficiencies will show up in a short time if land is not manured with these constituents. It is of interest to note that the soil at one plantation showed no response to potash fertilizer after four crops had been grown without potash. The explanation appears to be that, on this plantation, it has been the practice for many years to put relatively large amounts of vacuum pan molasses on the pens when making up manure.

SOUR GRASS.

The permanent manurial trials, which were laid down at a red and a black soil centre in 1931, have continued to yield interesting results. At the black soil centre, the nitrogen and nitrogen plus phosphate plots are now yielding little more grass than the no-manure plots. The limiting factor is definitely potash, since the nitrogen plus potash plot yields about 100 per cent. more grass than the no-manure plot. At the red soil centre, the nitrogen and nitrogen plus phosphate plots are yielding about 50 per cent. more grass than the no-manure plot, but the appearance of the grass shows definite symptoms of potash deficiency. The nitrogen plus potash plot yields about 100 per cent. more grass than the no-manure plot, and the grass does not become infected with the red rust disease which is so predominant on the no-potash plots. The addition of phosphate has had little or no effect on the yield of grass when combined with nitrogen, but, with nitrogen and potash, the addition of phosphate has increased the yield, at both centres, by about 40 per cent.

(c) REPORT ON THE ENTOMOLOGICAL SECTION FOR THE YEAR ENDING MARCH 31ST, 1936.

By R. W. E. TUCKER, M.A., B.Ed.,

Entomologist.

Six months of the year under review were taken up by ordinary and study leave in England, during which period the Fourth Imperial Entomological Conference was attended, and a course in Agricultural Statistics with special reference to entomological problems was taken at Cambridge University. A very interesting entomological feature of this period was the breeding and release of 11,596 *Lixophaga* parasites for the control of *D. saccharalis* in the Applewhaites to Lamunings Valley. During the remaining portion of the year, the following routine and investigational work was undertaken.

Small Moth Borer—*Diatraea saccharalis*.

Estimates of borer damage were made at twelve factories and in 67 random fields of ripe cane to determine, as in previous years, joint or internode infestation, and loss due to cane rendered unrepairable by borer. Additional experiments were also carried out at six factories to compare the results obtained by our present very detailed analysis of the joints of the different sugar cane varieties which are bored by *D. saccharalis* with those obtained from the field practice which, it is understood, is conducted by other entomological workers in the British West Indies and in British Guiana.

By this means it is hoped to simplify annual estimates of borer damage in mill canes in factory yards, and at the same time to increase the samples counted, without either procedure interrupting the continuity of records made during the past several years, and also to make stable the results of all workers in the Caribbean area.

The data obtained have not yet been analysed and figures for factory and field borer damage in 1935-36 are not yet available, but there does not appear to be any doubt that the release of 115 million mass reared *Trichogramma* has reduced borer infestation below the figure to which it rose in 1935 when the adverse climatic conditions of 1934 and the release of only 91 million parasites, resulted in an increase in borer damage to the crop reaped in 1935.

Experiments in field plots at Codrington Experiment Station have been started in 1935-36 in order to obtain further data on *Diatraea* egg deposition and on the effect of removing all eggs laid in alternate plots of approximately one-fortieth of an acre each.

Counts of bored joints to determine the effect of cane variety on borer infestation have also been carried out as usual, in the cane maturity plots at Codrington, and it is hoped that as knowledge of the causes of differences in varietal

infestation accumulates, it may be possible to link up the breeding of cane varieties with entomology as a means for permanently reducing small moth borer infestation.

In continuation of reiterated statements that every effort would be made to establish the Tachinid, *Lixophaga diatraea* which parasitises the larvae of *D. saccharalis*, a strong laboratory colony of these parasites was maintained from 1934 to the spring of 1935 when from March onwards breeding work on this parasite was built up, and a total of 11,596 *Lixophaga* was liberated in the small area of the Applewhaites—Lammings Valley; thus in 1934 and 1935 a total of 15,676 *Lixophaga* has been liberated.

A preliminary assessment of the extent of establishment of this parasite was made in the latter half of March 1935, and the results are given on opposite page.



Twenty fields were examined in the Applewhaites to Mt. Wilton and Lam-mings Valley between March 16th and 30th, 1936, each field being indicated by a cross in the above sketch. The red crosses show those fields from which *Lixophaga* has been recovered.

The area examined received heavy liberations of *Lixophaga* in 1935, and liberations at Applewhaites, Fisherpond, Lammings and Mt. Wilton in 1934.

The number of dead hearts obtained from each field, and the results of the dissections thereof, are set out in the Table reproduced below.

From this it can be seen that the total number of dead hearts examined was 2,224, and that from these were obtained 1,024 living *Diatraea* larvae, 203 living *Diatraea* pupae, 102 empty *Diatraea* pupae, 12 larvae killed by *Cordyceps* and one *Microdus stigmaterus* (presumed: did not hatch) making a total of 1,342. A recovery of 1,342 *Diatraea* from 2,224 dead hearts shows that 60.3% of dead hearts examined contained or had contained recoverable *Diatraea*. This high proportion is probably due to the early date of this survey. Several dead hearts examined had two or three *Diatraea* larvae boring inside, and some contained a living pupa, and a more than half grown larva.

The *Cordyceps* recoveries work out at 0.9% ; this very low figure is usual in Barbados.

The *Lixophaga* recoveries were 22 in all; 10 from field dissections (i.e. living pupae or larvae in dead hearts) and 12 from parasitised larvae which completed their development in jars in the laboratory after removal from the field.

The total of 22 *Lixophaga* out of 1,342 *Diatraea* is a 1.64% recovery from the area surveyed; the latter being a practically unbroken area of cane. Only three fields out of twenty examined gave positive results:—

Field	No. of <i>Lixophaga</i> recovered	Percentage <i>Diatraea</i> recovered	No. of parasitism
Laura Long Ground, Applewhaites ..	5	103	4.85
Laura Jubilee, Applewhaites ..	9	61	14.75
Long Ground, Applewhaites ..	8	41	19.51

When the heavy liberation of 11,596 *Lixophaga* (males and gravid females) made in 1935 in the Applewhaites—Mt. Wilton and Lammings Valley is taken into consideration, together with the fact that the conditions of borer prevalence

in the early part of 1935, and of rainfall in the latter part of 1935 were as favourable as they are likely to be in Barbados for the establishment of *Lixophaga*, the above results cannot be considered encouraging. It will need, however, a fuller examination of fields around Applewhaites as well as in other areas of the 1934 and 1935 liberations when all the ripe cane has been reaped, and young cane only is left in the fields, to ascertain fully the establishment or otherwise of *Lixophaga*; all *Lixophaga* will then be concentrated in the fields of young cane. Special attention will be paid to the small area of recovery at Applewhaites and to surrounding areas.

Field.	Date.	Dead Hearts.	<i>Dia- traea</i> larvae.	Living <i>Dia- traea</i> pupae.	Empty <i>Dia- traea</i> pupae.	<i>Lixo- phaga</i> Pupae and Larvae.	<i>Lixo- phaga</i> empty puparia	<i>Cordy- ceps</i> .	Total Percen- tage <i>Lixo- phaga</i> .	Total Percen- tage <i>Cordy- ceps</i> .
	1936									
Laura Long Ground, Applewhaites ...	March 16th	176	85	14	4	5	0	2	4.85	1.93
Laura, Jubilee ...	"	112	48	4	0	9	0	0	14.75	0.0
Western Pond Fields. Two Fields at Fisher Pond ...	"	89	20	8	1	0	0	0	19.51	0.0
Long Ground, Applewhaites ...	" 18th	83	29	4	0	8	0	2	0	4.65
Field at Bend, near Fisher Pond ...	"	86	48	3	0	0	0	0	0	0.0
Rusher Field, Olive Branch ...	"	102	48	5	2	0	0	1	0	1.78
Stoke Hole, Fisher Pond ...	" 20th	117	72	13	4	0	0	0	0	0.0
Murder Field, Olive Branch ...	"	103	49	11	5	0	0	1	0	1.51
Barker's Field, and Above Barker's Field } Lammings	"	113 102	111	20	9	0	0	3	0	2.14
East Pond, Lammings ...	" 23rd	57	36	7	2	0	0	1	0	2.22
Old House Pond, Mt. Wilton ...	"	153	81	17	5	0	0	2	0	1.94
North Cragg Field, Mt. Wilton ...	"	132	61	10	1	0	0	0	0	0.0
Old Well Field, Walkes Spring ...	" 27th	186	85	26	22	0	0	0	0	0.0
Carried forward ...		1,611	773	145	61	22	0	12		

RESULTS OF LIXOPHAGA SURVEY. MARCH 1936. (Cont'd.)

Field.	Date.	Dead Hearts	<i>Dia- traea</i> larvae.	Living <i>Dia- traea</i> pupae.	Empty <i>Dia- traea</i> pupae.	<i>Lixo- phaga</i> Pupae and Larvae.	<i>Lixo- phaga</i> empty puparia.	<i>Cordy- ceps</i> .	Total Percen- tage <i>Lixo- phaga</i> .	Total Percen- tage <i>Cordy- ceps</i> .
Brought forward	...	1,611	773	145	61	22	0	12		
Mascoll Side, Mt. Wilton	March 27th	124	61	10	1	0	0	0	0	0.0
Mire Hole Field, Mt. Wilton	" 27th	120	42	7	5	0	0	0	0	0.0
Gully, or Woodfield, Clifton	" 30th	131	90	17	8	0	0	0	0	0.0
Horse Pond, Clifton	" 30th	104	31	14	11	0	0	0	0	0.0
Parish Field, Clifton	" 30th	131	27	10	16	0	0	0	0	0.0
		2,221	1,024	203	102	22	0	12	1.64	0.9

Root Borer of Sugar Cane—*Diaprepes abbreviatus*.

Damage from this pest has increased in one small section of the island from, it is presumed, the lack of adequate cultural control measures. In other cases, the heavy crop together with exceptional dry weather have caused a drying out, and browning of cane tops which may, however, be accentuated by root borer. This can only be determined when cane stumps are dug up and the ground forked or ploughed, and, to a certain extent, by the presence of adult beetles when they emerge after the rains set in.

Brown Hardback—*Lachnosterna smithi*.

As reported in 1934, 3,670 larvae of *Pyrophorus luminosus* were introduced from Puerto Rico and placed out in fields suitable with regard both to climatic conditions and to food supply. Reports have been received of the presence of fireflies i.e. adult beetles, in May 1935, at or near places where larvae were placed in the soil. Out of three larvae kept in the laboratory from 1933 and 1934 two are still alive, and in apparent good condition, though force of circumstances have kept them without food for at least a year. The larvae placed out in fields should therefore stand a good chance of developing fully and producing adults. The success of the introduction will possibly depend on whether the adults will mate and produce viable eggs in their new environment.

Scarabee—*Euscepes batatae*.

The scheme of investigation for this pest as outlined in the 1934 report has been carried out steadily. Some months of investigations and records on life history work were, however, rendered incomplete by the discovery of the method by which *E. batatae* both protects and renders inconspicuous the majority of its eggs after laying them; the eggs are laid singly. Hitherto, only the occasionally naked and unprotected eggs had been found and recorded, and there was always a discrepancy between the number of eggs found, and the obvious reproductive capabilities of the pest. Life history work in the laboratory is now producing satisfactory results, and is being correlated as extensively and as rapidly as circumstances permit, with field life history and possible control measures.

Stated as briefly as possible, the work in progress aims at finding out

- (a) how infestation of sweet potato fields originates, as the adult beetles appear to be incapable of flight; so far all attempts to lure or provoke them into flight have failed.
- (b) at what rate propagation takes place. That is, how many eggs does a fertile female produce. What is the hatching ratio of eggs, and survival rate of larvae. What is the cycle of each generation, and does it change during any period of the year;
- (c) what is the mortality rate of adults, and what is their survival period, and does either change with the season of the year;

- (d) how long can adults survive in the soil, without food, and what part is played by sweet potato "culls" or "strings" left in the fields, or by alternate host plants;
- (e) what practicable measures will kill the protected eggs, the larvae and pupae in potato vines above ground, and kill or repel adults in the soil of sweet potato fields before oviposition. Once the larvae have reached and burrowed into the sweet potato tubers, control appears at present, impossible;
- (f) can resistance of varieties of sweet potato be used to control the pest.

When the above brief outline of objectives is considered in conjunction with the fact that the weevil *E. batatae* is very small, coloured exactly like the soil in which the crop is grown, and does not to our present knowledge fly, all of which combine to render it exceedingly inconspicuous until it has infested the tubers, and that it has no known parasites of egg, larval, pupal or adult stage, and no known predators, it can be seen that effective control measures for a pest of this nature in a crop of low economic value, need considerable investigation.

Pink Bollworm of Cotton—*Pectinophora gossypiella*.

Despite the small acreage of cotton planted in Barbados in 1935, there was a heavy infestation by pink bollworm which had reached serious proportions by December 1935 in the majority of plantings, both plantation and peasant; many fields being rendered unreapable.

As a result of investigations it was concluded that there were three main contributory causes:—

- (1) too wide a period of time over which cotton could legally be planted;
- (2) a heavy attack by the leaf worm *Alabama argillacea*;
- (3) a shortening of the close season for cotton to a period of two months instead of at least four months.

The widened period of cotton planting meant that the major pests, *Alabama* and *Pectinophora*, bred up in the early plantings of cotton to the detriment of later plantings. The incidence of *Alabama* was accentuated by the high rainfall of 1935 which repeatedly removed the protective Paris green dusts applied to the cotton crops. The ensuing defoliation by *Alabama* not only weakened, dwarfed, or even killed the cotton plants, but caused flowering and bolling to be delayed and irregular, thus enabling pink bollworm attack to ruin the majority of bolls. The reduction of the close season from a minimum of four months to two months is, in view of the life history of *Pectinophora* inadequate, and resulted in bollworm infestation being both earlier and heavier than it should have been.

It is difficult to prevent a damaging interaction of two pests such as *Alabama* and *Pectinophora* when climatic conditions increase the incidence of *Alabama* as

stated above. Further, the regulations governing the planting of cotton, which are made with a view to obtaining a fairly universal and compact cotton harvest, and regulations governing the close season, by removing and destroying by burning the cotton plants as soon as possible after harvesting, together with adequate cleaning up of the cotton fields, are jointly governed by the needs of the sugar crop, to which cotton is entirely secondary.

As the control of pink bollworm in Barbados would appear to depend very largely on planting to get a uniform and limited period of harvesting, and on the prompt removal of cotton bushes and adequate cleaning of fields after harvest, so as to ensure an adequate close season, the fact that such measures are subordinated to the needs of the sugar crop, increases the difficulty of pink bollworm control.

Termites.

Termites are more generally known locally as white or wood ants. It is known that they occur in domestic and commercial structures, and in cane-fields in Barbados, and that several genera or species are present, and though there may be a steady and unobtrusive loss from these pests, there are no records of catastrophic damage, despite the prevalence of wooden structures in Barbados. Every attempt is being made to obtain adequate material for identification of species; also to make known to all concerned the standard remedies for white ant attack, and to have on the local market suitable and tested termiticides and wood preservatives. Any fundamental investigation into the termites of Barbados and the economic losses caused by them though recognised as both necessary and advantageous will at present have to await the completion of other problems now being investigated.

Other Insect Pests.

Routine identification of insect specimens sent in and advice on field and garden pests have continued as usual.

Tomato erinose due to the mite *Eriophyes cladophthirus* has shown that it can ruin plantings of tomato seedlings if allowed to infest seed beds or boxes; properly applied remedies however can prevent any serious and early damage from this pest.

General insect pest control in Barbados is handicapped by the lack of any universal use of adequate dusting and spraying machines, and of an adequate range and stock by commercial firms, of spraying and dusting materials. This is no doubt due to the fact that the overwhelmingly principal crop, namely sugar cane, does not call for the use and maintenance of spraying and dusting machines. The creation of a regular, commercial demand, for such apparatus, and insecticides for use on "catch" or rotation crops of low economic value, or on garden trees and plants, has not as yet made much headway.

Rat Control.

As past efforts have brought a reasonable amount of success, despite increased food supply and shelter for rats due to increased crops, this work is being continued as an annual campaign.

(d) REPORT OF THE PLANT DISEASES INSPECTOR

By D. R. D. WILES, D.I.C.T.A.

(1) MOSAIC DISEASE OF SUGAR CANE.

Inspection of the cane crop was continued during the year for the presence of the mosaic disease of the sugar cane by Inspectors appointed under the Mosaic Disease (Eradication) Act.

It is pleasing to report that no additional areas were placed on the list of Proclaimed Infected Areas and that it may be possible to remove some of the areas from the list during 1936, if they continue to be as free from infection. There is however one area, namely, Farm Road Tenantry, St. Peter, which will have to be re-included in the list due to the Department having no control over the source of supply of plants for this area.

The Corn Close Season extending from the 16th December 1935 to the 31st March 1936 was again proclaimed.

Owners and occupiers of land within the Proclaimed Infected Areas were supplied with cane plants during the planting season free from Mosaic Infection under the supervision of an Inspector from the following centres:—

Parish.	Centre.	Variety.
St. Michael	Belle Plantation	B.2935 and B.726
St. James and St. Thomas	Bennetts Plantation	B.2935
St. George	Groves Plantation	B.H.10(12) and B.726
St. John	Lemon Arbor Plantation	B.H.10(12)
St. Joseph	Mt. Wilton Plantation	B.H.10(12)

Inspection of several plots of owners and occupiers within the Proclaimed Infected Areas were carried out by an Officer of the Department previous to planting time so as to ensure that plants free of Mosaic Infection could be obtained from their plots and only four occupiers were refused permission.

It is also pleasing to record that there was a great demand by managers previous to the planting season to have their nursery plots inspected. It must however be borne in mind that due notice should be given to the Department so that all plots may be inspected in due time.

Reports on Individual Parishes.

Parish of St. Michael.

The mosaic infection in the tenantries of Goodland, Ivy and Weymouth has remained fairly high, due, no doubt, to these being large Corn growing areas as well as ratoon areas. The remainder of the parish has continued to show a decided improvement especially those areas where there was a heavy infection, a few years ago.

Parish of Christ Church.

On referring to the Comparative Table at the end of this section it will be observed that there is a slight decrease in mosaic infection in this parish. The infection is confined principally to the Pegwell and Enterprise Tenantries while a few holes have been found scattered throughout the parish on estates in very small numbers.

Parish of St. John.

There has been a decided improvement in this parish in the Proclaimed Infected Areas of Wakefield Plantation and Sherbourne Tenantry. The heaviest infection otherwise is to be found in Venture Tenantry while the plantations have continued to remain fairly free.

Parish of St. Joseph.

The Tenantry of Sugar Hill has been the one area in this parish which has not responded to the control of the mosaic disease of sugar cane to any appreciable extent, due, no doubt, to its being one of the areas in the Island where ratooning is carried on extensively. It is hoped that by constant roguing of the diseased stools and the supply of healthy plants through the Department that a decided improvement will be observed in the near future. There is also another great difficulty and that is to get the occupiers in this area to plant their crop at a proper time.

Parish of St. Peter.

The infected holes in this parish were all found in the Farm Road Tenantry, and while there has been a decided improvement it is hoped that by placing this area on the list of Proclaimed Infected Areas to have it entirely free in the very near future. No infected holes were found on any of the estates.

Parish of St. James.

There has been an appreciable decrease in the mosaic infection in this parish, and in many of the Proclaimed Infected Areas no diseased holes were found for the second year in succession, these areas will be removed from the list of Proclaimed Infected Areas later on.

Parish of St. Thomas.

There has been a slight increase in the number of mosaic diseased holes found in this parish due to an infection being found in a field at Mt. Wilton Plantation adjacent to the Sugar Hill Tenantry. Rock Hall Tenantry continues to improve and on the last inspection only 4 infected holes were found.

Parish of St. George.

The systematic inspection and the removal of infected holes as well as the supply of healthy cane plants to the Proclaimed Areas has, no doubt, materially assisted in making such a decided improvement in this parish and it is expected that by these methods a further decrease will be observed in the near future.

Parish of St. Andrew.

Contrary to expectations there was a heavy infection found at Spring Vale Plantation and it is pleasing to record that the departmental officers received the hearty co-operation of the owner and manager in assisting in controlling the Disease. It is hoped that by constant roguing of infected stools and careful inspection previous to planting that this estate will soon be entirely free.

All infected holes found during the period under review were destroyed to the satisfaction of the Inspectors with the exception of two instances which had to be dealt with accordingly.

For the period under review four complaints were lodged for breaches of the Mosaic Disease (Eradication) Act.

PARISH	1932		1933		1934		1935	
	Acreage Inspected	Number of Infected Holes	Acreage Inspected	Number of Infected Holes	Acreage Inspected	Number of Infected Holes	Acreage Inspected	Number of Infected Holes
St. Michael ..	2,979 $\frac{1}{2}$	3,561	3,231 $\frac{1}{4}$	3,511	2,647	7,306	2,437 $\frac{3}{4}$	5,160
Christ Church	4,062	646	3,591 $\frac{3}{4}$	419	3,554 $\frac{1}{4}$	369	3,942 $\frac{3}{4}$	451
St. Lucy ..	2,435 $\frac{3}{4}$	107	2,072 $\frac{3}{4}$	2	891 $\frac{1}{2}$	0	..	..
St. Peter ..	2,581	10	2,255 $\frac{3}{4}$	328	1,833 $\frac{3}{4}$	449	1,887	188
St. James ..	1,850	550	1,250 $\frac{1}{4}$	1,802	1,569 $\frac{1}{2}$	2,065	1,782	634
St. Thomas ..	1,498	4,087	1,627	668	952 $\frac{3}{4}$	91	1,226 $\frac{1}{2}$	418
St. Joseph ..	170 $\frac{3}{4}$	48	226 $\frac{1}{2}$	6,334	423 $\frac{1}{2}$	2,420	532 $\frac{3}{4}$	2,421
St. George ..	2,608 $\frac{3}{4}$	3,626	1,941 $\frac{3}{4}$	2,145	2,773	2,368	2,540 $\frac{1}{2}$	1,535
St. John ..	2,074 $\frac{1}{4}$	2,145	1,914 $\frac{1}{4}$	1,529	1,478	1,245	1,548	696
St. Andrew ..	..	..	..	..	1,250 $\frac{3}{4}$	90	1,754	2,274
Total ..	20,260	14,780	18,111 $\frac{1}{4}$	16,738	16,572	16,404	17,651 $\frac{1}{4}$	13,777

(2) INSPECTIONS UNDER THE COTTON DISEASES PREVENTION ACT.

As the presence of the Pink Bollworm of Cotton was not observed to any great extent during 1934-35 and Inspectors had visited the old fields during this period to ensure that the plots had been properly cleaned, the Cotton Close Season was fixed to extend from 1st June to 31st July, 1935, thereby giving a longer growing season.

The Okra Close Season was again proclaimed to extend from the 16th April, 1935, to the 15th May, 1935. The okra plots were inspected during this period, and it was found necessary to cancel six permits, the plots not being kept in accordance with the regulations.

The cotton crop planted in 1934 and reaped in 1935 realised a yield of 41,277 lb. lint (78 bales).

The cotton planting season commenced on the 1st August, 1935, and selected seed was distributed to applicants, the acreage planted being 247. There was an excellent germination and the young plants appeared to be making good progress in spite of the heavy rains. It was hoped that as there was a fairly good market for Sea Island cotton due to all old stocks being sold there might have been a greater advance in price thereby causing an increased acreage to be planted; this, however, did not materialise. Unfortunately the Cotton Leaf Worm, *Alabama argillacea*, made its appearance very early and in the majority of instances completely defoliated the trees before any dusting was done. The Pink Bollworm was found in St. Philip on the 19th November and in St. Lucy on the 22nd November, 1935. This pest materially damaged the crop lessening the yield considerably and fields that appeared as if they would give about 600—700 lb. of seed cotton per acre only realised around 100 lb. per acre. It was felt that due to this early attack that a longer Close Season should be resorted to thereby enabling the fields to be thoroughly cleaned.

The Peasant Cotton Plot Competition was again held in conjunction with the Peasants Agricultural Exhibition and the judging of the plots was very difficult, the instructions being carried out by practically all the entrants. The first prize was awarded to a plot in the parish of St. Philip.

For the period under review the holds of twenty-four ships were fumigated with Zyklon B., and 17,449 bags of Imported Cotton Seed disinfected by means of the Simon's Heater.

(3) MISCELLANEOUS INSPECTIONS OF IMPORTED PLANTING MATERIAL.

647	Packages of Bulbs, Rose trees, Vegetable and Flower Garden Seeds ....	....	....	Examined and Passed.
22	Packages Miscellaneous Plants ....	....	....	do.
47	Packages Orchids ....	....	....	do.
2	Cases Citrus Plants ....	....	....	do.
70	Citrus Plants ....	....	....	do.
6	Packages Rose Trees ....	....	....	do.
52	Rose Trees ....	....	....	do.
3	Cases Carnation Plants ....	....	....	do.
11	Lily Bulbs ....	....	....	do.
1	Package Mango Plants ....	....	....	do.
46	Mango Plants ....	....	....	do.
2	Packages Hibiscus Cuttings ....	....	....	do.
17	Hibiscus Plants ....	....	....	do.
2	Packages Ferns ....	....	....	do.
2	Bags Pineapple Suckers ....	....	....	do.
1	Package Crotons ....	....	....	do.
5	Cases Cacti ....	....	....	do.
10	Cacti Plants ....	....	....	do.
24	Oleander Cuttings ....	....	....	do.
6	Coconut Plants ....	....	....	do.
12	Ferns ....	....	....	Roots washed.
20	Palms ....	....	....	do.
660	Miscellaneous Plants ....	....	....	do.
11	Coconut Plants ....	....	....	Destroyed

SECTION III.
FINANCIAL STATEMENT.
EXPENDITURE AND REVENUE.

EXPENDITURE.

	£	s.	d.
Personal Emoluments	7,293	2	9
Travelling Allowances	839	5	4
Exhibition Expenses	144	16	4
Expenses in Control of Sugar Cane Mosaic Disease ..	1,550	6	3
Expenses in Control of Pink Bollworm of Cotton (Salaries of Sub-Inspectors)	258	12	0
Experiment Stations and Botanic Station	1,814	16	6
Chemical Laboratory	837	17	10
Entomology	327	5	11
Science Teaching at Harrison College	1,135	5	8
Analysis of Commercial Sugars and Molasses	709	18	10
Seed Distribution	105	9	2
Unforeseen Contingencies	24	9	5
Sundries	216	0	10
	15,266	6	10

REVENUE.

	£	s.	d.
Sale of Ornamental Plants	45	1	1½
Sale of Produce from Codrington Experimental Station ..	133	2	1
Sale of Cane Plants under Mosaic Disease Eradication Act	96	2	9½
Fees for Analysis of Sugars and Molasses	1,726	1	0
Fees for Analysis of Miscellaneous Samples	79	12	0
Fees for Fumigation of Schooners, etc.	17	3	4
Miscellaneous Receipts	57	6	7
	2,154	8	11

SECTION IV.

AGRICULTURAL LEGISLATION DURING 1935—36.

1. *An Act to impose a levy upon cotton exported from the island for the purpose of furthering the interests of the cotton industry (1935-35).*

Provides for a levy not exceeding one cent on every pound of cotton lint exported, the proceeds of which to be available for the use of the West Indian Sea Island Cotton Association.

2. *An Act to amend the Cotton Diseases Prevention Act, 1928-31 (1935-38).*

Provides for the employment of Cotton Inspectors during the first two months of the cotton growing season as well as during the close season and the two months previous to the close season as formerly.

3. *An Act to incorporate the Barbados Cotton Growers' Association (1935-60).*

4. *An Act to amend the Department of Science and Agriculture Act, 1925 (1935-68).*

Alters the titles of a number of Departmental Officers.

Provides for the appointment of a Peasants' Agricultural Instructor and an additional Science Master at Harrison College and an Entomological Assistant.

5. *An Act to stabilize the Fancy and Extra-Fancy Molasses Industry (1936-12).*

The Act seeks to stabilize the industry by imposing a tax for this year's molasses of one penny farthing on every gallon of molasses delivered for sale or shipped abroad. The proceeds will be divided amongst all those who have not manufactured molasses after the passing of the Act, so that all producers of canes may receive approximately the same amount for their produce.

APPENDIX I.

**Meteorological Observations. Recorded at the Meteorological Station,
Codrington.**

HEIGHT ABOVE SEA LEVEL 181 FEET.

Latitude 13° 7' 36" N. Longitude 59° 35' 57" W.

The following are summaries of the observations recorded for the year 1935. The details are given in Appendix II.

Barometric Pressure. The records refer to observations made at the hours of 9.00 a.m. and 3.00 p.m. only and are expressed in inches of mercury. During the year 1935 the mean pressure corrected for temperature and gravity and reduced to sea-level was at 9.00 a.m. 29.975, and at 3.00 p.m. 29.899, the highest pressure recorded being 30.070 on April 15th and the lowest 29.799 on October 3rd. For the ten-year period 1925-1934 the average barometric pressure was at 9.00 a.m. 29.975 and at 3.00 p.m. 29.898. The highest pressure recorded at 9 a.m. during the ten-year period was 30.127 inches on January 22nd, 1925, and the lowest pressure recorded at 3.00 p.m. was 29.704 on October 30th, 1929.

Temperature. The daily mean maximum temperature for the year 1935 was 84.5°F. and the daily mean minimum 72.1°F. The maximum extreme for the year was 88.5°F. registered on 23rd and 29th June and the minimum extreme was 64.5°F. registered on January 26th. The average daily mean temperature was 78.3°F., the highest monthly range 19.5°F., and the lowest 15.5°F., the mean monthly range being 17.5°F. For the ten-year period 1925-34 the daily mean maximum was 85.5°F., and the daily mean minimum 72.6. During the ten-year period the average daily mean temperature was 79.1°F., the maximum extreme was 91.5°F. on August 23rd, 1927, the minimum extreme 63.0°F. on February 18th, 1932, and the average monthly range 18.5°F.

Tension of Vapour and Relative Humidity. The mean tension of vapour for the year 1935 was at 8.00 a.m. .755 and at 5.00 p.m. .734. The mean relative humidity was at 8.00 a.m. 75.2% and at 5.00 p.m. 71.8%.

Wind. The daily (24-hour period) mean velocity of the wind during the year 1935 was 10.9 miles an hour. Records were kept of half-daily or 12-hour periods from 6.00 a.m. to 6.00 p.m. and 6.00 p.m. to 6.00 a.m.. The maximum velocity for any such 12-hour period was 23.0 miles an hour, recorded between 6.00 a.m. and 6.00 p.m. on June 18th and the minimum velocity was 2.7 miles an hour recorded between 6.00 p.m. and 6.00 a.m. on August 24th. The average daily (24-hour period) velocity for the ten years ended 1934 was 9.6 miles an hour.

Rainfall. The rainfall measured at the Government Meteorological Station during the year 1935 amounted to 56.37 inches. Rainfall was recorded on 208 days, the greatest fall being 4.20 inches on October 6th. For the ten-year period 1925-1934 the average rainfall was 49.47 inches and the average number of days annually on which rain fell was 205.

Rainfall of the Island. The average total rainfall for the year 1935 from 143 stations was 69.69 inches, being 9.70 inches above the average for the eighty-eight years ended December 31st, 1934 which was 59.99 inches.

APPENDIX II. METEOROLOGICAL REPORT FOR 1935.

DEPARTMENT OF AGRICULTURE, BARBADOS.

Height Above Sea-Level 181 feet.

Months	Barometric Pressure reduced to 32° Fahrenheit, Latitude 45° and Mean Sea Level.										Tension of Vapour.			Relative Humidity			Velocity miles per hour.	Rainfall.	No. of Days on which rain fell.			
	9 a.m.	3 p.m.	Mean.	Highest.	Lowest.	Max. Mean.	Min. Mean.	Max. Extreme.	Min. Extreme.	Mean for Month.	Range for Month.	Dew Point 8 a.m.	Dew Point 5 p.m.	8 a.m.	5 p.m.	Mean.				8 a.m.	5 p.m.	Mean.
January	29.978	29.901	29.939	30.031	29.812	82.1	69.6	83.5	64.5	75.8	19.0	68.1	67.4	69.1	67.3	68.2	75.1	70.8	72.9	9.5	2.56	14
February	30.011	29.933	29.971	30.052	29.876	83.2	69.5	85.0	65.5	76.3	19.5	67.5	66.1	67.5	64.6	66.0	74.7	67.0	70.8	11.9	1.70	14
March	30.025	29.942	29.983	30.063	29.879	83.9	70.7	86.0	67.5	77.5	18.5	66.3	65.3	66.7	62.7	63.7	68.6	63.8	66.2	14.4	2.13	20
April	29.983	29.902	29.942	30.070	29.861	85.1	70.7	86.5	67.5	77.9	19.0	67.2	66.8	66.8	66.2	66.5	66.1	65.1	65.7	11.5	1.51	11
May	29.988	29.921	29.955	30.045	29.867	84.7	72.9	86.0	70.0	77.8	16.0	71.0	69.7	75.9	72.9	71.1	74.8	72.1	73.4	12.9	5.56	18
June	29.995	29.928	29.962	30.038	29.873	86.3	74.1	88.5	71.0	80.3	17.5	70.2	69.7	73.9	72.7	73.3	67.5	65.9	66.7	12.6	.79	13
July	29.984	29.920	29.952	30.039	29.860	85.8	73.9	88.0	71.0	79.8	17.0	72.2	71.4	79.5	76.9	78.2	76.1	74.8	73.8	12.2	6.76	22
August	29.917	29.881	29.911	30.000	29.816	85.2	73.4	87.0	71.5	79.3	15.5	71.3	72.5	82.9	80.0	82.5	81.0	74.8	77.9	10.0	8.46	19
September	29.956	29.850	29.918	30.001	29.821	85.2	73.5	87.0	71.5	79.3	15.5	73.6	73.7	83.8	83.8	83.3	77.7	78.1	77.9	8.1	11.48	21
October	29.929	29.853	29.891	30.050	29.799	84.9	73.0	87.0	70.5	78.9	16.5	74.1	73.8	84.1	83.7	83.9	80.1	82.5	81.3	8.0	6.43	13
November	29.923	29.841	29.882	29.971	29.800	84.6	72.7	87.0	70.0	78.6	17.0	73.8	72.6	83.1	80.1	81.7	82.2	79.2	80.7	11.2	2.53	19
December	29.980	29.896	29.938	30.054	29.832	82.9	70.9	84.0	65.5	76.9	18.5	70.2	68.5	75.9	69.7	71.8	78.5	70.8	74.6			18
Average	29.975	29.899	29.937	30.034	29.841	84.5	72.1	86.3	68.8	76.3	17.5	70.7	69.8	75.5	73.1	74.5	75.2	71.8	73.5	10.9	56.37	202

APPENDIX III. SUMMARY OF BARBADOS RAINFALL FROM JANUARY TO DECEMBER, 1935.

NAME OF STATION.	No. of Stations	January		February		March		April		May		June		July		August		September		October		November		December		Total	
		Days	Inches	Days	Inches	Days	Inches	Days	Inches	Days	Inches	Days	Inches	Days	Inches	Days	Inches	Days	Inches	Days	Inches	Days	Inches	Days	Inches	Days	Inches
DISTRICT "A".																											
St. Michael	15	12	2.58	12	1.41	11	1.60	8	1.42	17	6.22	8	.82	21	7.56	19	6.75	19	8.26	12	10.23	17	5.71	15	2.97	171	55.53
Lowlands																											
DISTRICT "B".																											
Christ Church	16	11	3.28	12	1.49	11	1.58	9	1.12	17	5.93	9	1.09	20	7.82	19	6.68	20	8.81	14	8.84	17	6.83	15	3.73	174	57.20
Lowlands																											
St. George	9	16	4.84	17	2.81	14	2.71	9	2.62	19	6.00	11	1.96	21	8.97	20	9.98	20	9.20	14	11.96	19	12.06	15	5.72	195	78.83
Highlands																											
Lowlands	13	12	3.18	13	1.89	9	1.66	8	1.57	15	5.76	9	1.21	20	8.68	19	7.65	19	8.52	14	11.30	16	9.78	14	3.94	168	65.14
DISTRICT "C".																											
St. Philip	3	10	3.97	15	1.87	7	1.67	10	1.77	17	4.48	8	1.07	21	6.90	21	6.77	18	6.12	13	8.04	18	9.92	15	4.75	173	57.33
Highlands																											
Lowlands	18	12	3.70	13	1.59	9	1.61	7	1.49	18	4.46	8	1.09	21	7.58	19	6.42	19	6.72	12	9.04	17	8.69	14	4.42	169	56.81
St. John	12	13	5.37	14	2.64	14	2.27	9	2.24	19	4.80	10	1.87	22	8.77	22	9.28	19	7.93	14	9.80	19	11.55	16	5.70	191	72.22
Highlands																											
Lowlands	4	12	3.78	11	1.91	9	1.47	8	1.84	16	3.37	8	1.35	19	7.83	18	7.97	15	6.21	12	8.18	14	9.01	13	3.45	155	56.37
DISTRICT "D".																											
St. Thomas	9	17	4.98	18	4.01	14	2.94	12	2.94	18	6.49	12	2.26	22	11.01	22	10.10	18	9.59	14	7.95	20	10.82	17	5.50	204	78.59
Highlands																											
Lowlands	7	13	3.82	13	2.64	11	2.44	9	2.16	16	5.54	10	1.79	21	8.91	20	9.83	17	8.17	12	6.71	18	8.32	14	4.01	174	64.34
St. James	1	13	7.68	12	4.09	11	3.18	11	3.50	17	8.79	11	2.82	20	18.37	22	17.31	18	12.99	14	8.56	15	20.25	12	8.18	176	115.72
Highlands																											
Lowlands	8	13	2.90	15	2.20	14	2.05	8	1.69	15	5.19	9	1.39	21	8.75	19	9.90	19	9.00	11	6.43	18	7.39	17	3.60	179	60.49
DISTRICT "E".																											
St. Peter	5	12	4.51	12	2.27	10	1.74	8	1.44	18	4.44	10	1.26	20	10.67	24	9.48	18	8.84	13	10.78	19	16.16	18	5.50	182	77.09
Highlands																											
Lowlands	6	12	4.06	11	2.59	11	1.66	8	1.41	17	4.39	9	.91	21	9.42	22	10.43	20	10.24	13	7.80	19	12.81	18	4.86	181	70.58
St. Lucy	5	12	2.83	10	1.68	9	1.34	9	1.51	15	2.85	8	1.38	20	8.53	21	7.55	19	10.63	12	9.11	18	10.17	16	5.17	169	62.75
Lowlands																											
DISTRICT "F".																											
St. Joseph	5	15	5.31	16	3.47	12	2.24	13	2.54	21	5.62	12	1.84	22	11.06	23	10.10	20	9.19	15	9.37	20	9.53	19	5.30	208	75.57
Highlands																											
Lowlands	2	11	4.99	13	3.28	7	2.76	6	2.09	16	6.20	8	1.93	20	12.76	19	9.92	17	9.97	11	9.93	16	11.15	18	6.28	162	81.26
St. Andrew	4	14	6.11	11	2.51	8	1.31	9	1.60	15	3.76	10	1.47	21	9.09	19	9.02	19	8.53	12	9.37	20	18.72	16	4.64	174	76.13
Highlands																											
Lowlands	1	15	4.92	12	1.74	12	1.27	8	1.06	15	3.40	7	.70	23	9.53	21	6.38	18	6.21	14	9.96	21	12.79	15	4.22	181	62.18
Total	143	245	82.81	250	46.09	203	37.50	169	36.01	321	97.69	177	28.21	396	182.21	389	171.52	352	165.13	246	173.36	341	211.66	297	91.94	3386	1324.13
Average ..		13	4.36	13	2.43	11	1.97	8	1.90	17	5.14	9	1.48	21	9.59	20	9.03	19	8.69	13	9.12	18	11.14	16	4.84	178	69.69

APPENDIX III. SUMMARY OF BARBADOS RAINFALL FROM JANUARY TO DECEMBER, 1935.

NAME OF STATION.	No. of Stations	January		February		March		April		May		June		July		August		September		October		November		December		Total	
		Days	Inches	Days	Inches	Days	Inches	Days	Inches	Days	Inches	Days	Inches	Days	Inches	Days	Inches	Days	Inches	Days	Inches	Days	Inches	Days	Inches	Days	Inches
DISTRICT "A".																											
St. Michael Lowlands	15	12	2.58	12	1.41	11	1.60	8	1.42	17	6.22	8	.82	21	7.56	19	6.75	19	8.26	12	10.23	17	5.71	15	2.97	171	55.53
DISTRICT "B".																											
Christ Church Lowlands	16	11	3.28	12	1.49	11	1.58	9	1.12	17	5.93	9	1.09	20	7.82	19	6.68	20	8.81	14	8.84	17	6.83	15	3.73	174	57.20
St. George Highlands	9	16	4.84	17	2.81	14	2.71	9	2.62	19	6.00	11	1.96	21	8.97	20	9.98	20	9.20	14	11.96	19	12.06	15	5.72	195	78.83
Lowlands	13	12	3.18	13	1.89	9	1.66	8	1.57	15	5.76	9	1.21	20	8.68	19	7.65	19	8.52	14	11.30	16	9.78	14	3.94	168	65.14
DISTRICT "C".																											
St. Philip Highlands	3	10	3.97	15	1.87	7	1.67	10	1.77	17	4.48	8	1.07	21	6.90	21	6.77	18	6.12	13	8.04	18	9.92	15	4.75	173	57.33
Lowlands	18	12	3.70	13	1.59	9	1.61	7	1.49	18	4.46	8	1.09	21	7.58	19	6.42	19	6.72	12	9.04	17	8.69	14	4.42	169	56.81
St. John Highlands	12	13	5.37	14	2.64	14	2.27	9	2.24	19	4.80	10	1.87	22	8.77	22	9.28	19	7.93	14	9.80	19	11.55	16	5.70	191	72.22
Lowlands	4	12	3.78	11	1.91	9	1.47	8	1.84	16	3.37	8	1.35	19	7.83	18	7.97	15	6.21	12	8.18	14	9.01	13	3.45	155	56.37
DISTRICT "D".																											
St. Thomas Highlands	9	17	4.98	18	4.01	14	2.94	12	2.94	18	6.49	12	2.26	22	11.01	22	10.10	18	9.59	14	7.95	20	10.82	17	5.50	204	78.59
Lowlands	7	13	3.82	13	2.64	11	2.44	9	2.16	16	5.54	10	1.79	21	8.91	20	9.83	17	8.17	12	6.71	18	8.32	14	4.01	174	64.34
St. James Highlands	1	13	7.68	12	4.09	11	3.18	11	3.50	17	8.79	11	2.82	20	18.37	22	17.31	18	12.99	14	8.56	15	20.25	12	8.18	176	115.72
Lowlands	8	13	2.90	15	2.20	14	2.05	8	1.69	15	5.19	9	1.39	21	8.75	19	9.90	19	9.00	11	6.43	18	7.39	17	3.60	179	60.49
DISTRICT "E".																											
St. Peter Highlands	5	12	4.51	12	2.27	10	1.74	8	1.44	18	4.44	10	1.26	20	10.67	24	9.48	18	8.84	13	10.78	19	16.16	18	5.50	182	77.09
Lowlands	6	12	4.06	11	2.59	11	1.66	8	1.41	17	4.39	9	.91	21	9.42	22	10.43	20	1 0.24	13	7.80	19	12.81	18	4.86	181	70.58
St. Lucy Lowlands	5	12	2.83	10	1.68	9	1.34	9	1.51	15	2.85	8	1.38	20	8.53	21	7.55	19	10.63	12	9.11	18	10.17	16	5.17	169	62.75
DISTRICT "F".																											
St. Joseph Highlands	5	15	5.31	16	3.47	12	2.24	13	2.54	21	5.62	12	1.84	22	11.06	23	10.10	20	9.19	15	9.37	20	9.53	19	5.30	208	75.57
Lowlands	2	11	4.99	13	3.28	7	2.76	6	2.09	16	6.20	8	1.93	20	12.76	19	9.92	17	9.97	11	9.93	16	11.15	18	6.28	162	81.26
St. Andrew Highlands	4	14	6.11	11	2.51	8	1.31	9	1.60	15	3.76	10	1.47	21	9.09	19	9.02	19	8.53	12	9.37	20	18.72	16	4.64	174	76.13
Lowlands	1	15	4.92	12	1.74	12	1.27	8	1.06	15	3.40	7	.70	23	9.53	21	6.38	18	6.21	14	9.96	21	12.79	15	4.22	181	62.18
Total	143	245	82.81	250	46.09	203	37.50	169	36.01	321	97.69	177	28.21	396	182.21	389	171.52	352	165.13	246	173.36	341	211.66	297	91.94	3386	1 324.13
Average		13	4.36	13	2.43	11	1.97	8	1.90	17	5.14	9	1.48	21	9.59	20	9.03	19	8.69	13	9.12	18	11.14	16	4.84	178	69.69

